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SUGHRUE MION, PLLC
2100 PENNSYLVANIA AVENUE, N.W.
SUITE 800
WASHINGTON, DC 20037

EXAMINER	
PANWALKAR, VINEETA S	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/735,745	KIM, NAM-HYONG	
	Examiner	Art Unit	
	Vineeta S. Panwalkar	2611	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *16 December 2003*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-30* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-4,6-18 and 20-30* is/are rejected.

7)☒ Claim(s) *5 and 19* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *16 December 2003* is/are: a)☐ accepted or b)☒ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *See Continuation Sheet*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

Continuation of Attachment(s) 3). Information Disclosure Statement(s) (PTO/SB/08), Paper No(s)/Mail Date :9/8/06,4/20/06,11/21/05,8/10/05,5/4/04.

DETAILED ACTION

Drawings

1. The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the "second pulse generator" of claims 12 and 14 must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Rejections - 35 USC § 112

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 12-14 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Regarding claims 12 and 14, it is unclear from the claim language, what is meant by "second pulse generator". The specification merely mention the second sequence pulse generator (Paragraphs [20] and [21] on page 8), but from the supporting disclosure, there appears to be only one pulse generator that generates a second UWB pulse that is out of phase to the first UWB pulse sequence by a predetermined degree. Clarification/ correction is required.

Claim 13 is rejected under 35 U.S.C. 112, second paragraph, as being dependent on claim 12.

Hereinafter, in light of the specification, it is assumed that there is only one UWB pulse generator generating two types of pulses.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

3. Claims 12,13,15-18,20,22-24,26,27 and 29 are rejected under 35 U.S.C. 102(e) as being anticipated by Fullerton et al. (US 6937667 B1), hereinafter, Fullerton.

3a. Regarding claim 12, Fullerton shows a UWB (Column 1, lines 45-50 and column 2, lines 25-28) pulse sequence generation apparatus (Fig. 17) comprising:

- a pulse sequence generator (Fig. 17, unit 1722) which generates
- a first UWB pulse sequence (Fig. 17, output comprising "0"s is interpreted as first UWB sequence (Fig. 8, pulse 802); see column 14, line 25- column 15, line 45; column 23, lines 5-50) using a predetermined random number sequence (Fig. 17, code generator 1712 is interpreted as providing claimed predetermined random number sequence; Column 7, lines 35-50, column 15, lines 60-68; column 23, lines 5-15); and
- a second UWB pulse sequence that is out of phase to the first UWB pulse sequence by a predetermined degree (Fig. 17, output 1732 comprising "1"s is interpreted as claimed second sequence because "1" is represented by a pulse that is out of phase to the "0" pulse (Fig. 8 pulse 804)). (Column 14, line 25- column 15, line 45; column 23, lines 5-50).

(It is further pointed out that if applicant did intend to claim first and second pulse generators, Fullerton does show a first pulse generator (Fig. 9, pulser 922) and a

second pulse generator (Fig. 9, pulser 924), as claimed (See column 14, line 25 – column 16, line 28)).

3b. Regarding claim 13, Fullerton further shows the system, wherein a phase of the first UWB pulse sequence and a phase of the second UWB pulse sequence are set to be different from each other, using BPSK or QPSK (Fig. 8 and Column 14, line 25 – column 15, line 45, wherein flip modulation is interpreted as BPSK).

3c. Regarding claim 15, Fullerton shows a wireless data transmitting/receiving (Transmitter /receiver of Fig. 17 and Fig. 18 perform claimed method) method comprising:

- generating a random number sequence (Fig. 17, code generator 1712 is interpreted as performing claimed generating; Column 7, lines 35-50, column 15, lines 60-68; column 23, lines 5-15);
- generating a random-interval pulse sequence for data, which is to be transmitted, using the random number sequence (Fig. 17, Column 7, lines 35-50 and column 23, lines 13-40. Block 1708 is interpreted as providing claimed random interval and the sequence transmitted interpreted as claimed random-interval pulse sequence);
- generating a reference template pulse sequence (Fig. 18, template 1870 is interpreted as generating claimed reference) used to detect a start point of the received random-interval pulse sequence; receiving the random-interval pulse sequence and detecting information regarding a start point of a random

number sequence used to generate the received random-interval pulse sequence, using the reference template pulse sequence; generating reference pulse sequences for a signal 0 and a signal 1 based on the start point information regarding the random number sequence(Column 23, line 50 – column 24, line 45); and

- comparing (Fig. 23, comparator 2308 performs claimed comparison) the reference pulse sequences for the signal 0 and the signal 1 with the received random-interval pulse sequence and determining whether the value of the received random-interval pulse sequence is 0 or 1 based on the result of comparison (Column 27, line 52 – column 28, line 17).

3c. Regarding claim 16, Fullerton further shows the method, wherein the random-interval pulse sequence is generated at an Ultra Wide Band (UWB) (Column 1, lines 45-50 and column 2, lines 25-28).

3d. Regarding claim 17, Fullerton further shows the method, wherein the random-interval pulse sequence generator generates the random-interval pulse sequence using pulse position modulation (Column 9,lines 45-67).

3f. Regarding claim 18, Fullerton further shows the method, wherein the template pulse sequence generator generates the reference template pulse sequence based on information regarding the same random number sequence as a

transmitter uses to generate the random-interval pulse sequence. (Column 10, lines 32-52).

3g. Regarding claim 20, Fullerton further shows the method, wherein the template pulse sequence generator generates the pulse sequences such that each pulse of the pulse sequence corresponding to the signal 0 is out of phase with each pulse of the pulse sequence corresponding to the signal 1 by a predetermined degree (Fig. 8, pulse 802 represents "0" and 804 represents "1". Column 14, line 25- column 15, line 45; column 23, lines 5-50).

3h. Regarding claim 22, Fullerton shows a wireless data transmitting/receiving (Transmitter /receiver of Fig. 17 and Fig. 18 perform claimed method) method comprising:

- generating a reference template pulse sequence (Fig. 18, template 1870 is interpreted as generating claimed reference) used to detect a start point of the received random-interval pulse sequence; receiving the random-interval pulse sequence and detecting information regarding a start point of a random number sequence used to generate the received random-interval pulse sequence, using the reference template pulse sequence; generating reference pulse sequences for a signal 0 and a signal 1 based on the start point information regarding the random number sequence(Column 23, line 50 – column 24, line 45); and

- comparing (Fig. 23, comparator 2308 performs claimed comparison) the reference pulse sequences for the signal 0 and the signal 1 with the received random-interval pulse sequence and determining whether the value of the received random-interval pulse sequence is 0 or 1 based on the result of comparison (Column 27, line 52 – column 28, line 17).

3i. Regarding claim 23, Fullerton further shows the method, wherein the random-interval pulse sequence is generated at an Ultra Wide Band (UWB) (Column 1, lines 45-50 and column 2, lines 25-28).

3j. Regarding claim 24, Fullerton further shows the method, wherein the template pulse sequence generator generates the pulse sequences such that each pulse of the pulse sequence corresponding to the signal 0 is out of phase with each pulse of the pulse sequence corresponding to the signal 1 by a predetermined degree (Fig. 8, pulse 802 represents "0" and 804 represents "1". Column 14, line 25- column 15, line 45; column 23, lines 5-50).

3k. Regarding claim 26, Fullerton shows a UWB (Column 1, lines 45-50 and column 2, lines 25-28) pulse sequence generation method (Apparatus of Fig. 17 performs claimed method) comprising:

- generating a first UWB pulse sequence (Fig. 17, output comprising "0"s is interpreted as first UWB sequence (Fig. 8, pulse 802); see column 14, line 25-column 15, line 45; column 23, lines 5-50) using a predetermined random

number sequence (Fig. 17, code generator 1712 is interpreted as performing claimed generating; Column 7, lines 35-50, column 15, lines 60-68; column 23, lines 5-15); and

- generating a second UWB pulse sequence to be out of phase with the first UWB pulse sequence (Fig. 17, output 1732 comprising "1"s is interpreted as claimed second sequence because "1" is represented by a pulse that is out of phase to the "0" pulse (Fig. 8 pulse 804)). (Column 14, line 25- column 15, line 45; column 23, lines 5-50).

3l. Regarding claim 27, Fullerton further shows the method, wherein a phase of the first UWB pulse sequence and a phase of the second UWB pulse sequence are set to be different from each other, using BPSK or QPSK (Fig. 8 and Column 14, line 25 – column 15, line 45, wherein flip modulation is interpreted as BPSK).

3m. Regarding claim 29, Fullerton shows a computer readable recording medium for recording a program (Column 43, line 1 – column 44, line 40) which executes a UWB (Column 1, lines 45-50 and column 2, lines 25-28) pulse sequence generation method (Apparatus of Fig. 17 performs claimed method) comprising:

- generating a first UWB pulse sequence (Fig. 17, output comprising "0"s is interpreted as first UWB sequence (Fig. 8, pulse 802); see column 14, line 25-column 15, line 45; column 23, lines 5-50) using a predetermined random number sequence (Fig. 17, code generator 1712 is interpreted as performing

claimed generating; Column 7, lines 35-50, column 15, lines 60-68; column 23, lines 5-15); and

- generating a second UWB pulse sequence to be out of phase with the first UWB pulse sequence (Fig. 17, output 1732 comprising "1"s is interpreted as claimed second sequence because "1" is represented by a pulse that is out of phase to the "0" pulse (Fig. 8 pulse 804)). (Column 14, line 25- column 15, line 45; column 23, lines 5-50).

4. Claim 28 is rejected under 35 U.S.C. 102(e) as being anticipated by Richards et al.(US 2002/0196845 A1), hereinafter, Richards.

4a. Regarding claim 28, Richards shows a UWB (Paragraphs [0001] and [0002]) pulse sequence generation method (Apparatus of Fig. 8 performs claimed method) comprising:

generating a first UWB pulse sequence using a predetermined random number sequence (Fig. 8, code source 812 is interpreted as performing claimed generating; paragraphs [0071] and [0131]); and generating a second UWB pulse sequence whose pulse width is wider than the pulse width of the first UWB pulse sequence by a predetermined degree.(Fig. 8,unit 822 is interpreted as performing claimed . See Paragraphs [0099]-[0103] and [0128]- [0132], wherein sequence having pulses representing "0" is claimed first UWB pulse sequence and sequence having pulses representing "1" is claimed second UWB pulse sequence).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

5. Claims 1-4, 6-11, 21, 25, 28 and 30 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fullerton in view of Richards.

5a. Regarding claim 1, Fullerton shows a wireless data transmitting (Fig. 17) and receiving (Fig. 18) system comprising:

- a random number generator (Fig. 17, code generator 1712) which generates a random number sequence (Column 7, lines 35-50, column 15, lines 60-68; column 23, lines 5-15);

- a random-interval pulse sequence generator which generates a random-interval pulse sequence of data, which is to be transmitted, using the random number sequence generated by the random number generator (Fig. 17, Column 7, lines 35-50 and column 23, lines 13-40. Block 1708 is interpreted as providing claimed random interval and the sequence transmitted interpreted as claimed random-interval pulse sequence);
- a template pulse sequence generator (Fig. 18, template 1870) which generates a reference template pulse sequence used to detect a start point of the random-interval pulse sequence and generates sequences for a signal 0 and a signal 1; a random number sequence detector (Fig. 18, unit 1808) which receives the random-interval pulse sequence and detects information regarding a start point of a random number sequence, which is used to make the received random-interval pulse sequence, using the reference template pulse sequence (Column 23, line 50 – column 24, line 45); and
- a comparator (Fig. 23, comparator 2308) which compares the pulse sequences for the signal 0 and the signal 1 based on the start point information regarding the random number sequence with the received random-interval pulse sequence, and determines whether the value of the received random-interval pulse sequence is 0 or 1 (Column 27, line 52 – column 28, line 17).

Thus, Fullerton shows all the limitations claimed, but fails to explicitly show whether the template pulse generator generates pulse sequences for a signal 0 and a signal 1 by changing widths of pulses.

However, in the same field of endeavor, Richards shows a wireless receiver (Fig. 9) for the impulse radio communication system wherein the template pulse generator generates pulse sequences for a signal 0 and a signal 1 by changing widths of pulses (Paragraph [0144]).

Thus, it would have been obvious to a person of ordinary skill in the art to change the width of the pulses as shown by Richards in the receiver shown by Fullerton, because Richards' technique improves the received signal quality of a recovered information signal by removing interference measured at interference sample times (Paragraph [0146]).

5b. Regarding claim 2, Fullerton further shows the system, wherein the random-interval pulse sequence is generated at an Ultra Wide Band (UWB) (Column 1, lines 45-50 and column 2, lines 25-28).

5c. Regarding claim 3, Fullerton further shows the system, wherein the random-interval pulse sequence generator generates the random-interval pulse sequence using pulse position modulation (Column 9,lines 45-67).

5d. Regarding claim 4, Fullerton further shows the system, wherein the template pulse sequence generator generates the reference template pulse sequence based on information regarding the same random number sequence as a transmitter uses to generate the random-interval pulse sequence. (Column 10, lines 32-52).

5e. Regarding claim 6, Fullerton further shows the system, wherein the template pulse sequence generator generates the pulse sequences such that each pulse of the pulse sequence corresponding to the signal 0 is out of phase with each pulse of the pulse sequence corresponding to the signal 1 by a predetermined degree (Fig. 8, pulse 802 represents "0" and 804 represents "1". Column 14, line 25- column 15, line 45; column 23, lines 5-50).

5f. Regarding claim 7, Fullerton further shows the system, the template pulse sequence generator generates reference pulse sequences with signal 0 and signal 1 (Fig. 8, pulse 802 represents "0" and 804 represents "1". Column 14, line 25- column 15, line 45; column 23, lines 5-50)

Thus, Fullerton shows but fails to explicitly show whether the template pulse generator generates pulse sequences for a signal 0 and a signal 1 by adjusting widths of pulses so as to distinguish between the 0's and the 1's.

However, in the same field of endeavor, Richards shows a wireless receiver (Fig. 9) for the impulse radio communication system wherein the template pulse generator generates pulse sequences for a signal 0 and a signal 1 by adjusting widths of pulses (Paragraph [0144]).

Thus, it would have been obvious to a person of ordinary skill in the art to change the width of the pulses as shown by Richards in the receiver shown by Fullerton, because Richards' technique improves the received signal quality of a recovered

information signal by removing interference measured at interference sample times (Paragraph [0146]).

5g. Regarding claim 8, Fullerton shows a wireless data receiving (Fig. 18) apparatus comprising:

- a template pulse sequence generator (Fig. 18, template 1870) which generates a reference template pulse sequence used to detect a start point of a received random-interval pulse sequence and generates a pulse sequence for a signal 0 and a pulse sequence for a signal 1; random number sequence detector (Fig. 18, unit 1808) which receives the random-interval pulse sequence and detects information regarding a start point of a random number sequence used to generate the random-interval pulse sequence (Column 23, line 50 – column 24, line 45); and
- a comparator (Fig. 23, comparator 2308) which compares the pulse sequences for the signal 0 and the signal 1 based on the start point information regarding the random number sequence with the received random-interval pulse sequence, and determines whether the value of the received random-interval pulse sequence is 0 or 1 (Column 27, line 52 – column 28, line 17).

Thus, Fullerton shows all the limitations claimed, but fails to explicitly show whether the template pulse generator generates pulse sequences for a signal 0 and a signal 1 by adjusting widths of pulses.

However, in the same field of endeavor, Richards shows a wireless receiver (Fig. 9) for the impulse radio communication system wherein the template pulse generator generates pulse sequences for a signal 0 and a signal 1 by adjusting widths of pulses (Paragraph [0144]).

Thus, it would have been obvious to a person of ordinary skill in the art to adjust the width of the pulses as shown by Richards in the receiver shown by Fullerton, because Richards' technique improves the received signal quality of a recovered information signal by removing interference measured at interference sample times (Paragraph [0146]).

5h. Regarding claim 9, Fullerton further shows the system, wherein the random-interval pulse sequence is generated at an Ultra Wide Band (UWB) (Column 1, lines 45-50 and column 2, lines 25-28).

5i. Regarding claim 10, Fullerton further shows the system, wherein the template pulse sequence generator generates the pulse sequences such that each pulse of the pulse sequence corresponding to the signal 0 is out of phase with each pulse of the pulse sequence corresponding to the signal 1 by a predetermined degree (Fig. 8, pulse 802 represents "0" and 804 represents "1". Column 14, line 25- column 15, line 45; column 23, lines 5-50).

5j. Regarding claim 11, Fullerton further shows the system, the template pulse sequence generator generates reference pulse sequences with signal 0 and

signal 1 (Fig. 8, pulse 802 represents "0" and 804 represents "1". Column 14, line 25- column 15, line 45; column 23, lines 5-50)

Thus, Fullerton shows but fails to explicitly show whether the template pulse generator generates pulse sequences for a signal 0 and a signal 1 by adjusting widths of pulses so as to distinguish between the 0's and the 1's.

However, in the same field of endeavor, Richards shows a wireless receiver (Fig. 9) for the impulse radio communication system wherein the template pulse generator generates pulse sequences for a signal 0 and a signal 1 by adjusting widths of pulses (Paragraph [0144]).

Thus, it would have been obvious to a person of ordinary skill in the art to change the width of the pulses as shown by Richards in the receiver shown by Fullerton, because Richards' technique improves the received signal quality of a recovered information signal by removing interference measured at interference sample times (Paragraph [0146]).

5k. Regarding claim 14, Fullerton shows a UWB (Column 1, lines 45-50 and column 2, lines 25-28) pulse sequence generation method (Apparatus of Fig. 17 performs claimed method) comprising:

- a pulse sequence generator (Fig. 17, unit 1722) which generates
- a first UWB pulse sequence (Fig. 17, output comprising "0"s is interpreted as first UWB sequence (Fig. 8, pulse 802); see column 14, line 25- column 15, line 45; column 23, lines 5-50) using a predetermined random number sequence (Fig. 17, code generator 1712 is interpreted as providing claimed

predetermined random number sequence; Column 7, lines 35-50, column 15, lines 60-68; column 23, lines 5-15); and

- a second UWB pulse sequence (Fig. 17, output 1732 comprising "1"s is interpreted as claimed second sequence (Fig. 8 pulse 804)). (Column 14, line 25- column 15, line 45; column 23, lines 5-50).

(It is further pointed out that if applicant did intend to claim first and second pulse generators, Fullerton does show a first pulse generator (Fig. 9, pulser 922) and a second pulse generator (Fig. 9, pulser 924), as claimed (See column 14, line 25 – column 16, line 28)).

Thus, Fullerton shows all the limitations claimed, but fails to explicitly disclose whether the second pulse has pulse width that is wider than the pulse width of the first UWB pulse sequence by a predetermined degree.

In the same field of endeavor, however, Richards shows a UWB pulse generator (Fig. 8, unit 822) for the impulse radio communication system wherein the pulse generator generates pulse sequences wherein the second pulse has pulse width that is wider than the pulse width of the first UWB pulse sequence by a predetermined degree (Paragraph [0099]-[0103]).

Thus, it would have been obvious to a person of ordinary skill in the art to adjust the width of the pulses as shown by Richards in the receiver shown by Fullerton, because Richards' technique improves the received signal quality of a recovered information signal by removing interference measured at interference sample times (Paragraph [0146]).

5l. Regarding claim 21, Fullerton further shows the method, wherein the template pulse sequence generator generates reference pulse sequences with signal 0 and signal 1 (Fig. 8, pulse 802 represents "0" and 804 represents "1". Column 14, line 25- column 15, line 45; column 23, lines 5-50)

Thus, Fullerton shows but fails to explicitly show whether the template pulse generator generates pulse sequences for a signal 0 and a signal 1 by adjusting widths of pulses so as to distinguish between the 0's and the 1's.

However, in the same field of endeavor, Richards shows a wireless receiver (Fig. 9) for the impulse radio communication system wherein the template pulse generator generates pulse sequences for a signal 0 and a signal 1 by adjusting widths of pulses (Paragraph [0144]).

Thus, it would have been obvious to a person of ordinary skill in the art to change the width of the pulses as shown by Richards in the receiver shown by Fullerton, because Richards' technique improves the received signal quality of a recovered information signal by removing interference measured at interference sample times (Paragraph [0146]).

5m. Regarding claim 25, Fullerton further shows the method, wherein the template pulse sequence generator generates reference pulse sequences with signal 0 and signal 1 (Fig. 8, pulse 802 represents "0" and 804 represents "1". Column 14, line 25- column 15, line 45; column 23, lines 5-50)

Thus, Fullerton shows but fails to explicitly show whether the template pulse generator generates pulse sequences for a signal 0 and a signal 1 by adjusting widths of pulses so as to distinguish between the 0's and the 1's.

However, in the same field of endeavor, Richards shows a wireless receiver (Fig. 9) for the impulse radio communication system wherein the template pulse generator generates pulse sequences for a signal 0 and a signal 1 by adjusting widths of pulses (Paragraph [0144]).

Thus, it would have been obvious to a person of ordinary skill in the art to change the width of the pulses as shown by Richards in the receiver shown by Fullerton, because Richards' technique improves the received signal quality of a recovered information signal by removing interference measured at interference sample times (Paragraph [0146]).

5n. Regarding claim 28, Fullerton shows a UWB (Column 1, lines 45-50 and column 2, lines 25-28) pulse sequence generation method (Apparatus of Fig. 17 performs claimed method) comprising:

- generating a first UWB pulse sequence (Fig. 17, output comprising "0"s is interpreted as first UWB sequence (Fig. 8, pulse 802); see column 14, line 25-column 15, line 45; column 23, lines 5-50) using a predetermined random number sequence (Fig. 17, code generator 1712 is interpreted as performing claimed generating; Column 7, lines 35-50, column 15, lines 60-68; column 23, lines 5-15); and

- generating a second UWB pulse sequence (Fig. 17, output 1732 comprising "1"s is interpreted as claimed second sequence (Fig. 8 pulse 804)). (Column 14, line 25- column 15, line 45; column 23, lines 5-50).

Thus, Fullerton shows all the limitations claimed, but fails to explicitly disclose whether the second pulse has pulse width that is wider than the pulse width of the first UWB pulse sequence by a predetermined degree.

In the same field of endeavor, however, Richards shows a UWB pulse generator (Fig. 8, unit 822) for the impulse radio communication system wherein the pulse generator generates pulse sequences wherein the second pulse has pulse width that is wider than the pulse width of the first UWB pulse sequence by a predetermined degree (Paragraphs [0099]-[0103]).

Thus, it would have been obvious to a person of ordinary skill in the art to adjust the width of the pulses as shown by Richards in the receiver shown by Fullerton, because Richards' technique improves the received signal quality of a recovered information signal by removing interference measured at interference sample times (Paragraph [0146]).

5o. Regarding claim 30, Fullerton shows a computer readable recording medium for recording a program (Column 43, line 1 – column 44, line 40) which executes a UWB (Column 1, lines 45-50 and column 2, lines 25-28) pulse sequence generation method (Apparatus of Fig. 17 performs claimed method) comprising:

- generating a first UWB pulse sequence (Fig. 17, output comprising "0"s is interpreted as first UWB sequence (Fig. 8, pulse 802); see column 14, line 25-

column 15, line 45; column 23, lines 5-50) using a predetermined random number sequence (Fig. 17, code generator 1712 is interpreted as performing claimed generating; Column 7, lines 35-50, column 15, lines 60-68; column 23, lines 5-15); and

- generating a second UWB pulse sequence (Fig. 17, output 1732 comprising "1"s is interpreted as claimed second sequence (Fig. 8 pulse 804)). (Column 14, line 25- column 15, line 45; column 23, lines 5-50).

Thus, Fullerton shows all the limitations claimed, but fails to explicitly disclose whether the second pulse has pulse width that is wider than the pulse width of the first UWB pulse sequence by a predetermined degree.

In the same field of endeavor, however, Richards shows a UWB pulse generator (Fig. 8, unit 822) for the impulse radio communication system wherein the pulse generator generates pulse sequences wherein the second pulse has pulse width that is wider than the pulse width of the first UWB pulse sequence by a predetermined degree (Paragraphs [0099]-[0103]).

Thus, it would have been obvious to a person of ordinary skill in the art to adjust the width of the pulses as shown by Richards in the receiver shown by Fullerton, because Richards' technique improves the received signal quality of a recovered information signal by removing interference measured at interference sample times (Paragraph [0146]).

Allowable Subject Matter

6. Claims 5 and 19 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Conclusion

7. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure:

- McCorkle et al. (US 20030053555 A1) disclose a UWB system.
- Skudera et al. (US 5257284) and Langlais (US 6091932) show that a BPSK signal simply flips the phase of a constant amplitude RF carrier by 180 degrees.

Contact Information

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Vineeta S. Panwalkar whose telephone number is 571-272-8561. The examiner can normally be reached on M-F 8:30-5:00.
If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mohammad Ghayour can be reached on 571-272-3021. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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VP

JAY K. PATEL
SUPERVISORY PATENT EXAMINER